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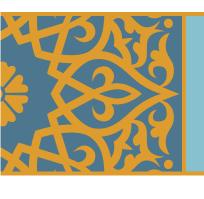
Impacts of Financial Inclusion on Human Capital Development in the Arab Region

Dr Saed Khalil; Dr Jamel Jouini; Dr Anwar Othman

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Abstract

This study investigates the impact of financial inclusion, proxied by the number of bank branches, on human capital development for 12 Arab economies over the 2004-2019 period based on the pooled mean group (PMG) approach in the framework of dynamic panel data models. The main finding is that financial inclusion enhances the human capital development in the considered countries over the long-run, which is aligned with the theory that the more people have access to financial services, the better their life conditions will be; and this is reflected in the levels of education, health, and thus human capital development. Additionally, the study finds that per capita income, government expenditure, population, and trade openness exert positive and significant effects on human capital development, while credit to the private sector is positive but not significant over the long-run. The empirical outcomes have important policy implications for authorities to improve the relationship between financial inclusion and human capital development in the Arab economies under consideration.

1. Introduction

Financial inclusion has become a main policy objective in many countries, especially developing countries. Indeed, financial inclusion contributes significantly to human capital development, which in turn is a critical factor in the growth process and economic development. The vast majority of the literature has highlighted that strengthening human capital plays a crucial role in economic development and creates more inclusive societies. Human capital is developed by investing in people's health and well-being, as well as their access to good education and training. According to Barro and Sala-i-Martin (1999), human capital is a relevant driver of growth over the long-run even in the absence of exogenous technological progress. In addition to innovation, there is a consensus among researchers that human capital is an essential element in achieving sustainable economic growth.

The primary goal of the current study is to investigate the nexus between financial inclusion and human capital development in the Arab region over the 2004-2019 period[1] by controlling for auxiliary factors into the analysis. More specifically, we aim to check how enhancing access to financial products and services improves human

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[1] Data related to the years 2020 and 2021 has been excluded from the analysis due to the COVID-19 pandemic, having a clear impact on health and education indicators, and thus on human capital development.

capital development and its main dimensions, namely education and health.

The remainder of the paper consists of four sections. Section 2 reviews the related literature in the field. Section 3 presents the methodology of the study, the data, and the model specification. The empirical findings are discussed in Section 4. Section 5 concludes the study and provides policy recommendations.

2. Literature review

This section outlines the related theoretical and empirical research on the nexus between financial inclusion and human capital development and their impact on economic growth. Such an understanding is important for the Arab countries to conduct empirical studies on this nexus to establish related economic, financial, and social policies aiming at enhancing economic growth and attaining sustainable development.

The term "human capital" is typically used by economists to describe the economic value of a worker's experience and skills. Education, training, health, intelligence, and skills that boost an individual's productivity are referred to as human capital (see Garavan et al., 2001; Youndt et al., 2004; and Goldin, 2016).

Most theoretical models stress the importance of human capital in promoting economic growth (see Nelson and Phelps,1966;

Lucas,1988; Becker et al., 1990; Rebelo, 1991; and Mulligan and Sala-i-Martin, 1992). Endogenous growth theory is built on the basic principle that the increase in capital stock (physical and human) creates beneficial externalities that raise productivity (see Romer, 1986, 1990; and Lucas, 1988). Human capital can be seen as a production factor that works with physical capital both at the individual and national levels. Production frameworks demonstrate that increasing human capital is both a prerequisite and a consequence of economic growth (see Mincer, 1984).

According to economic theory, human capital contributes to economic growth. A broad range of empirical studies confirms this relationship, such as Lucas (1988), Barro (1991, 2001), Barro and Lee (1996), Blundell et al. (1999), Pelinescu (2015), Adeyemi and Ogunsola (2016), Ogunleye et al. (2017), Hakooma and Seshamani (2017), and Diebolt and Hippe (2018).

In empirical research, there is no consensus on which is the indicator that works as the best proxy for human capital. Although most studies use years of schooling as a proxy for human capital, such as Schultz (1961), Becker (1964), Schultz (1999), and Moretti (2004a, b). Other studies employ healthcare indicators as proxies of human capital, such as Oster et al. (2013). In a similar context, Tsaurai (2020) uses the Internet usage as a proxy for human capital.

The theoretical literature contends that some factors, such as economic expansion, financial advancement, public spending on

health and education, and foreign direct investment, have a positive effect on human capital. Other variables, such as trade openness and population growth have a mixed effect on human capital development. Table 1 summarizes a set of determinants and their expected impact on human capital development.

Table 1. Theoretical determinants of human capital development

Variable	Theoretical intuition	Expected effect
Economic Growth	High rates of economic growth boost per capita income and wealth and increase the country's capacity to allocate more resources towards developing the human capital (see Shuaibu and Oladayo, 2016).	Positive (+)
Financial Development	Financial development enhances human capital by facilitating the efficient and effective use of financial products, and when the financial sector is developed, more credit will be extended towards education and health, thus boosting human capital development (see Kargbo et al., 2016).	Positive (+)
Government Final Consumption	The higher the government spending on education, skills, and health, the more developed is the human capital (see Oluwatobi and Ogunrinola, 2011).	Positive (+)
Trade Openness	Trade openness enables the interchange of skills around the globe, which will have a favorable impact on human capital development (see Binder and Georgiadis, 2011). But, the process of developing human capital will not be aided if trade openness has a detrimental impact on economic growth.	Mixed (+/-)

Population Growth	Rapid population growth, according to Rosenzweig (1990), allocates resources towards necessary needs like food instead of human capital. However, high population growth attracts more foreign direct investment, thus improving human capital (see Jorgenson, 1963).	Mixed (+/-)
Foreign Direct Investment	Foreign direct investment brings technologies and know-how to the host country (see Lucas, 1988; and Romer, 1986). Kumar and Pradhan (2002) argue that foreign direct investment inflows into the host country encompasses technical know-how, capital, knowledge, technical and managerial skills, etc.	Positive (+)

Table 2 summarizes the empirical findings.

Table 2. Empirical determinants of human capital development

Authors	Findings
Attanasio (2015)	Economic growth enhances human capital development in developing countries.
Oketch (2006)	Per capita growth enhances human capital in African countries.
Hasan (2000)	In developing countries, economic growth and per capital income are the primary factors of human capital development.
Tsaurai (2018)	Human capital development in emerging economies is facilitated by economic growth, foreign direct investment, financial development, trade openness, and infrastructure development.
Praise and George-	Economic expansion and the health-related aspect of human capital development are correlated in both directions. The mortality rate is decreased by

Anokwuru (2018)	government health spending. Economic growth and expenditure on education have a feedback effect on the educational sector in Nigeria.
Rastogi and Gaikwad (2017)	In the BRICS region, gross domestic product and foreign direct investment have a strong beneficial impact on human capital.
Behrman and Schneider (1992)	Human capital in India is connected with economic growth, foreign direct investment, and trade openness.
Zulkifli et al. (2017)	Foreign direct investment does not affect human capital development in Malaysia.

Financial inclusion is seen as a key factor of sustainable development, as access to finance allows people, especially the poor, to benefit from formal financial services (see Subbarao, 2009). According to Chakraborty (2010), "*financial inclusion is a strategy for economic development because of the increasing concern that the benefits of economic growth have not been equitably shared*".

Access to financial products and services plays an essential role in improving the quality of life and education in any society, as stated by many studies. The World Bank defines financial inclusion as "*the access to useful and affordable financial products and services that meet individuals and businesses' needs (transactions, payments, savings, credit, and insurance) delivered in a reasonable and sustainable way*".

Three dimensions are used to gauge financial inclusion: Access to financial services, utilization of financial services, and the quality of

financial products and service delivery.[2] A set of indicators has been developed to measure financial inclusion, such as the number of bank branches per 100,000 adults, which represents the first dimension (access to financial services). Other indicators represent the usage of financial services, such as the percentage of adults having an account in a formal financial institution, the number of depositors or deposit accounts per 1,000 adults, and the percentage of at least one loan outstanding from a formal financial institution.

The relationship between financial inclusion and human capital has been examined in the literature. Indeed, Beck et al. (2007) claim that financial inclusion alleviates poverty and reduces income inequality, thus leading to a higher level of human capital. Chou and Chinn (2001) state that financial inclusion is a key factor of financial development, thus leading to further creation of human capital. Thakurata and D'Souza (2018) report that financial excluded households prefer assets that have negative return over human capital development. Raichoudhury (2016) finds that financial inclusion and the level of human capital development in a country move closely with each other, with existing few exceptions. Rahmi and Aliasuddin (2020) find that financial inclusion and income have a significant positive effect on human capital investment.

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[2] G20 leaders endorsed the G20 Basic Set of Financial Inclusion indicators at the Los Cabos Summit in June 2012.

According to Matekenya et al. (2021), having access to and using financial services enables people to invest in their health and education, and promote start-ups, which will have a positive impact on human capital. They also find that financial inclusion has a positive effect on human capital development in Sub-Saharan African countries. Arora (2012) investigates in 21 developing Asian countries the connection between financial development and human capital development, and finds a significant inverse relationship between financial development, proxied by money supply to GDP ratio, and the quality of primary education, assessed by trained teachers and pupil teacher ratio. There is also no clear pattern between financial development and educational indices in the selected countries.

3. Econometric methodology

The response of human capital to the changes in financial inclusion has not been extensively examined in the literature for the Arab region. For this purpose, the current study sheds light on such a nexus for a set of 12 Arab economies (Algeria, Egypt, Jordan, Kuwait, Lebanon, Morocco, Oman, Palestine, Qatar, Saudi Arabia, Tunisia,

and the United Arab Emirates (UAE)) based on annual data over the 2004-2019 period.[3]

3.1. Data and model

The model specification is set up to assess the reaction of human capital development index to the changes in financial inclusion by controlling for auxiliary determinants into the model. Analytically, we consider the following specification:

$$HDI_{it} = \beta_0 + \beta_1 BRANCH_{it} + \beta_2 lGNIC_{it} + \beta_3 GFCE_{it} + \beta_4 TO_{it} + \beta_5 lPOP_{it} + \beta_6 BCPS_{it} + \varepsilon_{it} \tag{1}$$

where $i = 1, \dots, N$ stands for cross-sectional unit (country) and $t = 1, \dots, T$ for time, HDI_{it} is the human capital development index,[4] $BRANCH_{it}$ is number of bank branches per 100,000 adults,[5]

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[3] The analysis is based on only 12 countries in the Arab region due to significant data gaps, and the choice of the study period is constrained by missing data in some variables across the selected economies.

[4] The index is built on three dimensions: education measured by mean years of schooling; health measured by life expectancy at birth; and income measured by income per capita. Source of data is the United Nations Development Program (UNDP).

[5] Source of data is the IMF global financial development database and financial access survey.

proxying financial inclusion.[6] Obviously, there are other variables used to measure financial inclusion, such as the number of bank accounts, the number of deposit accounts, the number of ATMs, the number of borrowers, etc. Given the lack of sufficient data on these indicators for all selected Arab countries during the sample period, the number of bank branches is used to measure financial inclusion in the model.[7]

Other auxiliary variables are included into the model, namely, the logarithm of gross national income per capita (constant 2015 US$) ($lGNIC_{it}$), the general government final consumption expenditure[8] (as a percentage of GDP) ($GFCE_{it}$), the trade openness (ratio of the sum of exports and imports to GDP) (TO_{it}), the logarithm of the population in thousands ($lPOP_{it}$), and the domestic credit to private

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[6] Demirgüç-Kunt and Klapper (2013) outline that one of the main functions of well-developing financial systems is to facilitate people's access to products and services, such as payments, savings, credit, and risk management.

[7] The Findex database, published by the World Bank, is a comprehensive database that contains a range of financial inclusion indicators, such as access to bank accounts, usage of digital financial services, and availability of credit, among others. However, one limitation of the Findex database is that it covers only four years of data, which means that it may not provide enough data to conduct a robust analysis.

[8] Data on public spending on health and education is limited for the selected Arab countries.

sector by banks (as a percentage of GDP) $(BCPS_{it})$.[9] ε_{it} is the disturbance term.

Descriptive statistics for the variables under consideration are reported in Table 3. They show that the mean value of the human capital development index in the selected Arab countries is around 0.75 and ranging from 0.56 in Morocco in 2004 to 0.89 in the UAE in 2019. It is worth mentioning that the highest score for the index is 1. Data shows that there are 13.75 bank branches for 100,000 adults on average in the selected countries. Gross national income per capita ranges between USD 4,337.3 to USD 98,715.8 with an average of USD 31,878.3 for the selected countries.

Table 3. Descriptive statistics of the variables

Variable	Mean	Median	Std. Dev.	Min	Max
HDI	0.75	0.74	0.07	0.56	0.89
BRANCH	13.75	13.32	6.23	3.80	26.86
GNIC	31,878.34	11,649.28	30,026.27	4,337.27	98,715.77
GFCE	17.37	17.51	4.93	6.73	30.00
TO	90.27	88.95	27.80	30.25	176.75
POP (thousands)	19,228.99	8,550.00	23,714.32	682.00	100,388.00
BCPS	57.46	58.89	24.22	11.09	109.08

Government final consumption expenditure to GDP ratio is around 17.4 percent on average in the selected Arab countries over the 2004-

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[9] Data on these auxiliary variables is gathered from the World Bank database.

2019 period. Trade openness is around 90.3 percent, and the average of domestic credit to private sector by banks as a share of GDP is around 57.5 percent between 2004 and 2019 in the selected Arab countries.

The correlation matrix presented in Table 4 indicates that some independent variables are correlated to a satisfactory degree, as the correlation coefficient ranges from -0.485 to 0.606, which may reflect a certain degree of multicollinearity among these variables.

Table 4. Correlation matrix

Variable	BRANCH	*l*GNIC	GFCE	TO	*l*POP	BCPS
BRANCH	1.000					
*l*GNIC	0.019	1.000				
GFCE	-0.008	-0.226	1.000			
TO	0.324	0.435	-0.181	1.000		
*l*POP	-0.485	-0.464	-0.133	-0.458	1.000	
BCPS	0.606	0.173	0.037	0.414	-0.192	1.000

To check for potential multicollinearity, we employ the variance inflation factor (VIF), which is calculated for each explanatory variable to test whether that variable is collinear with the other

independent variables in the model.[10] In this vein, a VIF exceeding 4 (or tolerance, 1/VIF, below 0.25) points to possible multicollinearity between the considered independent variable and the other variables, and further investigation is needed. A VIF greater than 10 or (tolerance, 1/VIF, below 0.1) points to significant multicollinearity between the considered independent variable and the other variables, and a correction is needed. The results reported in Table 5 show evidence of no multicollinearity among the independent variables of the model, as the VIF is below 3 (tolerance, 1/VIF, above 0.33), thus implying that we can opt for the model specified above to examine the responses of human capital development to the changes in financial inclusion by controlling for the auxiliary variables into the model.

Table 5. Multicollinearity test results

Variable	VIF	1/VIF
BRANCH	2.83	0.35
lGNIC	2.20	0.46
GFCE	1.70	0.59
TO	1.93	0.52
lPOP	2.74	0.36
BCPS	2.97	0.34

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[10] In linear regression models, the VIF is the ratio of the total variance of the model including all the independent variables to the total variance of the model including only the associated independent variable.

3.2. Estimation issues

We apply the PMG approach in the framework of panel data models, proposed by Pesaran et al. (1999), which permits the short-run parameters and error variances to differ across groups, compared to common procedures, while constraining the long-run parameters to be identical. Practically, we aim at estimating the following ARDL(p, q):

$$y_{it} = \mu_i + \delta_i t + \sum_{j=1}^{p} \beta_{ij} y_{i,t-j} + \sum_{j=0}^{q} \gamma'_{ij} X_{i,t-j} + \varepsilon_{it} \qquad (2)$$

where i = 1, 2,…,12 and t = 1, 2,…,16. Y_{it} is the human capital development index (HDI_{it}), X_{it} is a ($k \times 1$) vector of explanatory variables, namely financial inclusion proxy ($BRANCH_{it}$) and control variables ($lGNIC_{it}$, $GFCE_{it}$, TO_{it}, $lPOP_{it}$, and $BCPS_{it}$), μ_i and δ_i refer to country-specific effects, ε_{it} is the error term, and p and q are the model orders, which are determined by the Schwarz criterion.

The vector error correction model is written as follows:

$$\Delta y_{it} = \mu_i + \delta_i t + \theta_i \left(y_{i,t-1} - \varphi'_i X_{it} \right) + \sum_{j=1}^{p-1} \beta^*_{ij} y_{i,t-j} \\ + \sum_{j=0}^{q-1} \gamma^{*\prime}_{ij} X_{i,t-j} + \varepsilon_{it} \qquad (3)$$

where $\left(y_{i,t-1} - \varphi'_i X_{it} \right)$ is the long-run association between human capital development and the set of the explanatory variables under study, $\left(\theta_i = \sum_{j=1}^{p} \beta_{ij} - 1 \right)$ is the error correction term (expected to be negative and statistically significant) that measures the speed of

adjustment of human capital development towards its long-run equilibrium state in case of any disturbance in the regressors in the previous period.

The coefficients vector $\left(\varphi_i = \frac{\sum_{j=0}^{q} \gamma_{ij}}{1-\sum_{j=1}^{p} \beta_{ij}}\right)$ assesses the long-run impacts of the independent variables on human capital development, and the coefficients $(\beta_{ij}^* = -\sum_{l=j+1}^{p} \beta_{il})$ and $(\gamma_{ij}^* = -\sum_{l=j+1}^{q} \gamma_{il})$ measure the short-run responses of human capital development to the changes in the set of explanatory variables.

4. Discussion of the results

4.1 Unit root tests

The PMG approach is not suitable for integrated variables of order 2, $I(2)$. For this purpose, we apply panel unit root tests to confirm that the variables are not $I(2)$. The results reported in Table 6 show that the gross national income per capita, government expenditure, trade openness, and population are integrated of order zero, $I(0)$, while the number of bank branches and the domestic credit to private sector by banks are integrated of order one, $I(1)$. Human capital development index is $I(0)$ following the common unit root test, while it is $I(1)$ following the individual unit root test. Therefore, all variables are either $I(0)$ or $I(1)$, thus allowing to run the PMG approach.

Table 6. Panel unit root tests results

Variable	Level		First difference	
	LLC	**IPS**	**LLC**	**IPS**
HDI	-3.0371***	-0.2887	-	-4.4572***
BRANCH	0.3693	0.4279	-6.0232***	-3.4864***
*l*GNIC	-5.6812***	-2.4791***	-	-
GFCE	-1.7130**	-1.4991*	-	-
TO	-4.2393***	-2.1579**	-	-
*l*POP	-3.2727***	-2.5950***	-	-
BCPS	0.5938	1.5988	-9.6914***	-4.7472***

Notes: LLC stands for Levin, Lin, and Chu common unit root test; and IPS stands for Im, Pesaran, and Shin individual unit root test. The tests include individual intercept and trend. ***, **, and * stand for stationarity at 1%, 5%, and 10% levels, respectively.

4.2 Model results

The PMG estimate outcomes of the reaction of human capital development to the changes in financial inclusion from the full set of 12 Arab economies over the 2004 – 2019 period are displayed in Table 7. They show that financial inclusion exerts a positive and significant impact on human capital development in the long-run. Indeed, an addition of 1000 bank branches per 100,000 adults leads to an increase in human capital development index by 3 units. The inclusion of more people into the formal financial system by increasing the number of bank branches allows them to benefit from financial services, which will have a positive impact on their living standards, namely education and health, and thus human capital.

Regarding the control variables, the gross national income per capita affects human capital development significantly and positively, where an increase of the logarithm of the gross national income per capita by one unit improves human capital development by 0.086 unit. Higher income levels allow the country to allocate more resources to improve the people's living conditions, thus enhancing the level of human capital.

Table 7. PMG estimation results

Variable	Coefficient	t-statistic
	Long-Run	
BRANCH	0.003^{***}	6.668
lGNIC	0.086^{***}	12.339
GFCE	0.001^{***}	5.311
lPOP	0.044^{***}	13.327
TO	$3.28\text{E-}4^{***}$	5.099
BCPS	1.01E-05	0.239
	Short-Run	
COINTEQ01	-0.391^{***}	-4.297
D(HDI(-1))	0.075	0.803
D(BRANCH)	-0.002	-1.310
D(LGNIC)	0.019	1.192
D(GFCE)	-3.59E-4	-0.981
D(LPOP)	0.116	0.495
D(TO)	3.52E-05	0.399
D(BCPS)	-4.52E-05	-0.434
Cst	-0.3486^{***}	-4.394

Notes: The PMG model is a panel ARDL(2,1,1,1,1,1,1). The short-run estimates are calculated by averaging the coefficients across economies. "D" stands for first difference. *** stand for statistical significance at the 1%.

The general government expenditure has a positive and significant impact on human capital development in the Arab countries, thus

confirming the theoretical relationship between government expenditure and human capital development. When Arab governments increase their expenditures to GDP ratio by one percent, human capital development increases by 0.001 unit. Population growth and trade openness exert positive and significant effects on human capital development. Many studies show that countries with higher population growth attract more foreign direct investment, which improves productivity, and thus human capital. Regarding trade openness, it facilitates the exchange of educational skills among countries and helps improve human capital development. The domestic credit to private sector by banks (as a percentage of GDP) is not significant, but positive, implying that the credit provided to the private sector is not allocated towards education and health.

Regarding the error correction term, the results show that it is negative and statistically significant, thus reflecting the validity of the long-run relationship. It suggests that the model adjustment towards the equilibrium state is 39.1 percent each year follwoing a chock. In other words, the model needs around 2 years and 7 months to return towards the long-run equilibrium after any shock or short-run deviation happens.

The short-run estimates are all insignificant, thus indicating that financial inclusion and other macroeconomic and social variables need time to have an impact on human capital development. In other

words, human capital development is associated with long-run policies and is not affected by short-run volatilities.

5. Conclusion and policy recommendations

The study investigates the impact of financial inclusion on human capital development by controlling for auxiliary variables into the analysis for a set of 12 Arab countries over the 2004-2019 period by applying the PMG approach to estimate a dynamic panel data model.

The key finding of this paper is that financial inclusion promotes the human capital development in the Arab countries over the long-run, which is in line with previous empirical studies, such as Beck et al. (2007), Chou and Chinn (2001), Thakurata and D'Souza (2018), Raichoudhury (2016), and Rahmi and Aliasuddin (2020). The outcome is also consistent with the theory that the more people have access to financial services, the better their life conditions will be, thus reflecting in the levels of education and health, and thus human capital development.

The auxiliary variables exert a positive and significant impact on human capital development, except of the credit to the private sector by banks, which is not significant. Most developing countries, including Arab countries, face the issues of high level of information asymmetry and moral hazard in the financial sector, which are considered as a main challenge against extending credit to the public,

especially the low-income groups of the society, and thus negatively impacting financial inclusion.

The study provides policy recommendations to the Arab authorities to pay a special attention to financial inclusion in order to enhance the human capital development, especially for the unfortunate segment of the society. It is also important to improve lending policies and encourage savings to ensure that financial services cover all segments and sectors, especially the financially excluded segments and sectors. Special attention is recommended to be given to the health and education sectors, as they play a pivotal role in enhancing human capital and achieving economic development.

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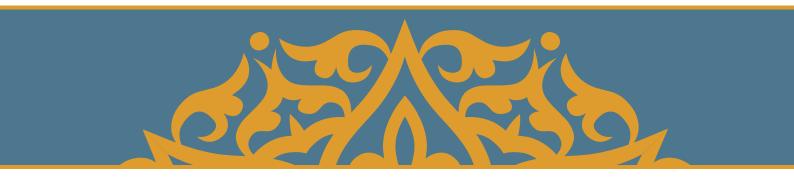Subbarao, D. (2009). Financial inclusion: challenges and opportunities. Reserve Bank of India.

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